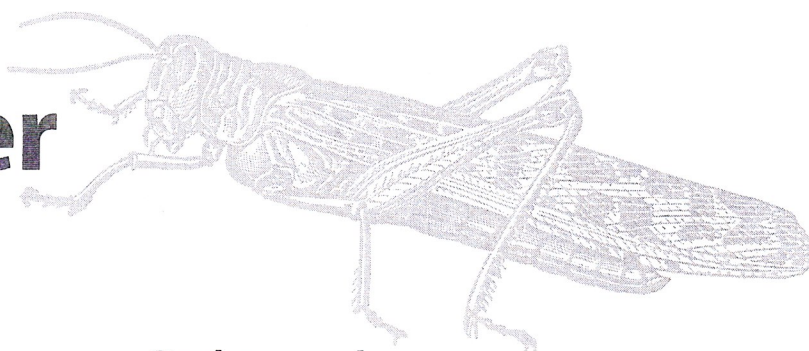


Grasshopper Gravity



Objectives

Students will (1) describe the relationship between the structure and function of grasshoppers; (2) generalize that wildlife ranges from small to large organisms and exists in a variety of forms; and (3) recognize that people have influence on other animals, and with that influence comes the responsibility to act with compassion.

Method

Students observe, handle, and describe live grasshoppers or crickets.

Materials

Plastic containers to collect grasshoppers in, hand lens, live grasshopper or cricket for every two students, chalkboard

Grade Level: K-4

Subject Areas: Science, Language Arts, Environmental Education

Duration: one 45-minute session or longer if all questions on page 6 are used; the activity can also serve as basis for two-week unit of study

Group Size: any

Setting: outdoors and indoors

Conceptual Framework Topic Reference: WPIA2

Key Terms: wildlife, compound, antennae, appendage, estimate, habitat, responsibility

Appendices: Outdoors, Field Ethics, Animals in Schools, Early Childhood Classrooms

Background

"Grasshopper" is the common name for any of the winged insects with hind legs adapted for jumping. They include the longhorned grasshoppers, pygmy grasshoppers, and shorthorned grasshoppers, or locusts. They are distributed worldwide wherever vegetation grows.

Grasshoppers are 1 to 5 inches (3 to 13 centimeters) long when fully grown. They are closely related to crickets, and male grasshoppers make chirping noises similar to those produced by crickets. Pygmy grasshoppers are the smallest grasshoppers. Longhorned grasshoppers have antennae that, when folded back, extend beyond the hind end of the body. Longhorned grasshoppers include the katydids, the meadow grasshoppers, and the so-called Mormon cricket (*Anabrus simplex*). Shorthorned grasshoppers, also known as true grasshoppers, are named for their relatively short antennae. A common species, the American grasshopper (*Schistocerca americana*), is about 4 inches (10 centimeters) long when fully grown.

While participating in this activity, students develop important observation skills and an increased appreciation for grasshoppers.

Procedure

1. To collect grasshoppers, send a small group of students outside with plastic containers and a clear plastic sheet. Have two students place the sheet over the ground while two other students collect the grasshoppers that have been trapped under the plastic sheet.

NOTE: Caution the students not to harm the grasshoppers. When the class is through studying the grasshoppers, release them. Be prepared, however, for an accidental mishap in which a grasshopper doesn't survive. Deal with such accidents on a case-by-case basis, encouraging the students to be careful.

2. The questions from page 6 may be used in a design for a data chart or table for the students to use while observing the grasshoppers. (This list can be shortened and different questions can be used.) Educators may want to define some of the vocabulary before using the questions—like “antennae,” and “appendage.”
3. Finally, remind the students that a grasshopper is only one kind of animal. Animals are all sizes and shapes. Some are smaller than a grasshopper and some—like the whale—are much, much bigger.
4. Ask the students to take the grasshoppers outside and let them go. Some of the students may want to keep the grasshoppers as pets. Talk with the students about how difficult it is for a grasshopper to live very long in captivity. How much space does a grasshopper need to live? Can you supply that in captivity? Tell the students that by studying grasshoppers they have done what some scientists do. They have studied something very carefully to learn more about it. People have power over other animals in many circumstances. The students exercised power over the grasshoppers while they studied them. With that power comes important responsibility. In this case, the students exercised their power by making an effort to be careful in handling the grasshoppers and releasing them safely. Ask the students about other situations in which they feel a responsibility for their actions affecting animals.
Examples: Taking care of pets, not leaving litter outside that can hurt wild animals.

Extensions

1. What contributions do grasshoppers make to ecological systems? What animals use grasshoppers as a food source?
2. Why do some farmers and gardeners consider grasshoppers a nuisance? Find out what actions, if any, can be taken to reduce crop damage from grasshoppers. Do the actions seem appropriate? Why or why not?

Aquatic Extensions

Do this activity with a water-related insect, if possible. Adjust the specific questions as needed to suit the insect's characteristics, still using these general categories: Interesting Features, Legs, Wings, Head, Mouth, Antennae, Motion, Noise, Colors, Habitat, Conclusions.

Evaluation

1. If you were a biologist studying wildlife, which of these could you study and call wildlife: tigers in India, deer in the forest, cows on a farm, foxes in Iowa, sparrows in the city, spiders in the forest, ants in a building, rats in a garbage dump, white mice in a laboratory cage? (probably all except the cows on a farm and the white mice in a laboratory cage)
2. Identify three wild animals that are smaller than a grasshopper.
3. Identify three wild animals that are larger than a grasshopper.
4. Identify three types of wildlife that have one of the same colors as your grasshoppers but aren't insects.
5. Show how grasshoppers protect themselves from predators in a simulation or kinesthetic activity format. Show how a grasshopper's body is adapted for survival.
6. Create several guidelines or rules that people should follow when studying wildlife. Explain why those rules are important. When, if ever, is it acceptable for people studying wildlife to damage or kill wildlife?

continued

Grasshopper Questions

Interesting Features

What are the features of a grasshopper?

Legs

How many legs does it have? Are they alike or different? Which legs are the jumping legs? Notice where the legs are attached to the grasshopper's body.

Wings

Look at the wings, if they are present. How many wings are there? Notice where they attach to the body.

Head

Look at the head. How many eyes do you see? Do they look like your eyes? Check carefully in front and below the large, compound eyes for three smaller, simpler eyes. Why do you think they have so many eyes? These eyes probably see light but may not be able to see shapes, sizes, and colors.

Mouth

Do you see a mouth? Does the grasshopper have lips? Try to feed the grasshopper a leaf to watch the mouth parts move. Hold the leaf up to the mouth just touching it. Do not try to put the leaf in the mouth, of the grasshopper. Try to describe the mouth parts and how they move.

Antennae

Where are the antennae? Are they each a long, string-like, single appendage, or are they made up of many parts? Can you count the parts? Do they all look alike in size, shape, and color? Why do you think a grasshopper needs the antennae? For what? Think about radio and television antennae.

Motion

We usually think that grasshoppers "hop." Do they also walk? How do they walk on the ground or floor? If possible, watch the grasshopper climb a small stick, weed stem, or blade of grass. Does it use all of its legs? Without hurting your grasshopper, place it on the ground and make it jump (if it is an adult with wings, it may fly instead). Follow it and make it hop or jump several times (at least five times). Does it hop the same distance each time? Measure or estimate the distance of each hop or flight. Does the grasshopper seem to get tired? What makes you think so?

Noise

Do grasshoppers make noises? If your grasshopper makes a noise, try to learn if it does it with its mouth or with some other part of its body.

Colors

Look at the whole grasshopper carefully. Is it the same color all over? Are the colors, shapes, and sizes the same on both sides? What is attractive about your grasshopper? Is it clean? Watch to see what the grasshopper does to clean or groom itself.

Habitat

Where does the grasshopper live? What does it eat? Do grasshoppers live in your neighborhood year-round? Suggest two reasons why grasshoppers might not be seen during the winter (such as freezing temperature, not enough food).

Conclusions

Did you think there were so many interesting things about grasshoppers? Do you think other insects might be as interesting? What other insects or small animals might be interesting to look at and learn more about?

